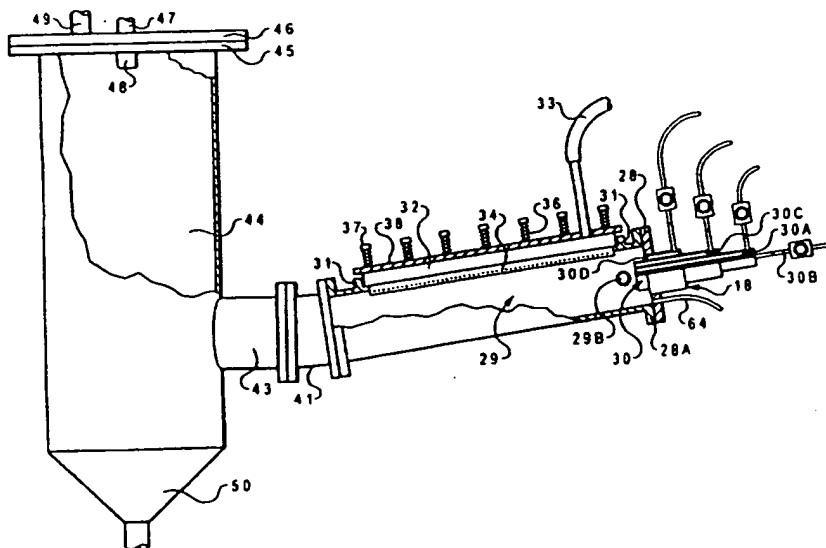




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(74) Agents: BERGEN, Grady, K. et al.; Felsman, Bradley, Gunter & Dillon, L.L.P., 2600 Continental Plaza, 777 Main Street, Fort Worth, TX 76102 (US).		<p>Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>	
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(54) Title: PROCESS FOR THE TRANSFORMATION OF HALOGENATED REFRIGERANT GASES



(57) Abstract

Process and apparatus for the high temperature combustion of hydrogen and oxygen used to transform halogenated refrigerant gases (HRGs) and halons to produce calcium fluoride salts. The burner assembly (18) is formed from a burner nozzle (30) constructed from concentric rings or conduits (30 A) readily spaced apart and surrounding a central conduit (30 B) to define annular passages or apertures (30 C). The reactants, hydrogen gas, oxygen gas and calcium chloride are injected into an inlet end of a reactor tube (29). The top of the reactor tube (29) has a rectangular spray bar mounting flange (31). A spray bar manifold (32) is provided for introducing cooling water into the reaction vessel (29). Cooling water or fluid is supplied to the manifold (32) via hose (33). Calcium carbonate is also produced by a series of chemical processes. Calcium chloride is partially consumed by the process by reaction with fluoride released during the high temperature combustion of the HRGs.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US/96/11708

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : B01D 53/70; C01F 11/20, 11/22

US CL : 422/168,182; 423/240S,431, 490,497; 588/209,213

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 422/168,182; 423/240S,431, 490,497; 588/209,213

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 3,804,386 (ARNOLD ET AL) 16 APRIL 1974, SEE COL. 2, LINES 18-52.	25-27
Y	US, A, 5,250,267 (JOHNSON ET AL) 05 OCTOBER 1993, SEE COL. 4, LINES 18-36.	25-27
Y	US, A, 4,125,593 (SCHEIFLEY ET AL) 14 NOVEMBER 1978 SEE COL. 2, LINE 7 TO COL. 3, LINE 52.	1-27
X	US, A, 5,185,134 (GULLETT) 09 FEBRUARY 1993, SEE COL. 2, LINES 48-68 AND COL. 7, LINES 48-68.	1-5
Y		----- 6-24
Y	US, A, 4,937,065 (MAURER ET AL) 26 JUNE 1990, SEE COL. 2, LINES 4-31.	1-24

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Date of the actual completion of the international search

13 SEPTEMBER 1996

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/11708

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 2,941,860 (ANNIS) 21 JUNE 1960, SEE COL. 1, LINE 66 TO COL. 3, LINE 20.	15, 18-24
Y	EP, A, 0,212,410 (AKTIENGESELLSCHAFT) 04 MARCH 1987, SEE COL. 2, LINE 13 TO COL. 3, LINE 51.	1-27